1600

RAW SEQUENCE LISTING
PATENT APPLICATION: **US/09/686,647A**

DATE: 01/28/2004
TIME: 13:53:04

Input Set : **A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT**
Output Set: **N:\CRF4\01282004\I686647A.raw**

```
 4 <110> APPLICANT: The Rockefeller University
 5       Jeffrey M. Friedman
 6       Yiying Zhang
 7       Ricardo Proenca
 8       Margherita Maffei
 9       Jeffrey L. Halaas
10       Ketan Gajiwala
11       Stephen K. Burley
13 <120> TITLE OF INVENTION: MODULATORS OF BODY WEIGHT, CORRESPONDING
14       NUCLEIC ACIDS AND PROTEINS, AND DIAGNOSTIC AND THERAPEUTIC
15       USES THEREOF
17 <130> FILE REFERENCE: 600-1-087/CIPDIVCON
19 <140> CURRENT APPLICATION NUMBER: 09/686,647A
20 <141> CURRENT FILING DATE: 2000-10-10
22 <150> PRIOR APPLICATION NUMBER: 09/183,374
23 <151> PRIOR FILING DATE: 1998-10-30
25 <150> PRIOR APPLICATION NUMBER: 08/347,563
26 <151> PRIOR FILING DATE: 1994-11-30
28 <150> PRIOR APPLICATION NUMBER: 08/292,345
29 <151> PRIOR FILING DATE: 1994-08-17
31 <160> NUMBER OF SEQ ID NOS: 42
33 <170> SOFTWARE: FastSEQ for Windows Version 4.0
35 <210> SEQ ID NO: 1
36 <211> LENGTH: 2793
37 <212> TYPE: DNA
38 <213> ORGANISM: murine
40 <400> SEQUENCE: 1
41 ggatccctgc tccagcagct gcaaggtgca agaagaagaa gatcccaggg aggaaaatgt 60
42 gctggagacc cctgtgtcgg ttcctgtggc tttggtccta tctgtcttat gttcaagcag 120
43 tgcctatcca gaaagtccag gatgacacca aaaccctcat caagaccatt gtcaccagga 180
44 tcaatgacat ttcacacacg cagtcggtat ccgccaagca gagggtcact ggcttggact 240
45 tcattcctgg gcttcacccc attctgagtt tgtccaagat ggaccagact ctggcagtct 300
46 atcaacaggt cctcaccagc ctgccttccc aaaatgtgct gcagatagcc aatgacctgg 360
47 agaatctccg agacctcctc catctgctgg ccttctccaa gagctgctcc ctgcctcaga 420
48 ccagtggcct gcagaagcca gagagcctgg atggcgtcct ggaagcctca ctctactcca 480
49 cagaggtggt ggctttgagc aggctgcagg gctctctgca ggacattctt caacagttgg 540
50 atgttagccc tgaatgctga gtttcaaag gccaccaggc tcccaagaat catgtagagg 600
51 gaagaaacct tggcttccag gggtcttcag gagaagagag ccatgtgcac acatccatca 660
52 ttcatttctc tccctcctgt agaccaccca tccaaaggca tgactccaca atgcttgact 720
53 caagttatcc acacaacttc atgagcacaa ggaggggcca gcctgcagag gggactctca 780
54 cctagttctt cagcaagtag agataagagc catcccatcc cctccatgtc ccacctgctc 840
55 cgggtacatg ttcctccgtg ggtacacgct tcgctgcggc ccaggagagg tgaggtaggg 900
56 atgggtagag cctttgggct gtctcagagt ctttgggagc accgtgaagg ctgcatccac 960
```

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Output Set: **N:\CRF4\01282004\I686647A.raw**

```
57 acacagctgg aaactcccaa gcagcacacg atggaagcac ttatttattt attctgcatt 1020
58 ctattttgga tggatctgaa gcaaggcatc agctttttca ggctttgggg gtcagccagg 1080
59 atgaggaagg ctcctggggt gctgctttca atcctattga tgggtctgcc cgaggcaaac 1140
60 ctaatttttg agtgactgga aggaaggttg ggatcttcca aacaagagtc tatgcaggta 1200
61 gcgctcaaga ttgacctctg gtgactggtt ttgtttctat tgtgactgac tctatccaaa 1260
62 cacgtttgca gcggcattgc cgggagcata ggctaggtta ttatcaaaag cagatgaatt 1320
63 ttgtcaagtg taatatgtat ctatgtgcac ctgagggtag aggatgtgtt agagggaggg 1380
64 tgaaggatcc ggaagtgttc tctgaattac atatgtgtgg taggcttttc tgaaagggtg 1440
65 aggcattttc ttacctctgt ggccacatag tgtggctttg tgaaaaggac aaaggagttg 1500
66 actctttccg gaacatttgg agtgtaccag gcacccttgg aggggctaaa gctacaggcc 1560
67 ttttgttggc atattgctga gctcagggag tgagggcccc acatttgaga cagtgagccc 1620
68 caagaaaagg gtccctggtg tagatctcca aggttgtcca gggttgatct cacaatgcgt 1680
69 ttcttaagca ggtagacgtt tgcatgccaa tatgtggttc tcatctgatt ggttcatcca 1740
70 aagtagaacc ctgtctccca cccattctgt ggggagtttt gttccagtgg gaatgagaaa 1800
71 tcacttagca gatggtcctg agccctgggc cagcactgct gaggaagtgc cagggcccca 1860
72 ggccaggctg ccagaattgc ccttcgggct ggaggatgaa caaagggggct tgggttttc 1920
73 catcacccct gcaccctatg tcaccatcaa actggggggc agatcagtga gaggacactt 1980
74 gatggaaagc aatacacttt aagactgagc acagtttcgt gctcagctct gtctggtgct 2040
75 gtgagctaga gaagctcacc acatacatat aaaaatcaga ggctcatgtc cctgtggtta 2100
76 gaccctactc gcggcggtgt actccaccac agcagcaccg caccgctgga agtacagtgc 2160
77 tgtcttcaac aggtgtgaaa gaacctgagc tgagggtgac agtgcccagg ggaaccctgc 2220
78 ttgcagtcta ttgcatttac ataccgcatt tcagggcaca ttagcatcca ctcctatggt 2280
79 agcacactgt tgacaatagg acaagggata ggggttgact atcccttatc caaaatgctt 2340
80 gggactagaa gagttttgga ttttagagtc ttttcaggca taggtatatt tgagtatata 2400
81 taaaatgaga tatcttgggg atggggccca agtataaaca tgaagttcat ttatatttca 2460
82 taataccgta tagacactgc ttgaagtgta gttttataca gtgtttttaaa taacgttgta 2520
83 tgcatgaaag acgtttttac agcatgaacc tgtctactca tgccagcact caaaaacctt 2580
84 ggggtttttgg agcagtttgg atcttgggtt ttctgttaag agatggttag cttataccta 2640
85 aaaccataat ggcaaacagg ctgcaggacc agactggatc ctcagccctg aagtgtgccc 2700
86 ttccagccag gtcatacct gtggaggtga gcgggatcag gttttgtggt gctaagagag 2760
87 gagttggagg tagattttgg aggatctgag ggc                            2793
89 <210> SEQ ID NO: 2
90 <211> LENGTH: 167
91 <212> TYPE: PRT
92 <213> ORGANISM: murine
94 <400> SEQUENCE: 2
95 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu
96  1               5                  10                  15
97 Ser Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
98          20                  25                  30
99 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
100         35                  40                  45
101 Gln Ser Val Ser Ala Lys Gln Arg Val Thr Gly Leu Asp Phe Ile Pro
102     50                  55                  60
103 Gly Leu His Pro Ile Leu Ser Leu Ser Lys Met Asp Gln Thr Leu Ala
104 65                  70                  75                  80
105 Val Tyr Gln Gln Val Leu Thr Ser Leu Pro Ser Gln Asn Val Leu Gln
106                 85                  90                  95
107 Ile Ala Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Leu Leu Ala
```

RAW SEQUENCE LISTING   DATE: 01/28/2004
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Input Set : **A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT**
Output Set: **N:\CRF4\01282004\I686647A.raw**

```
108                100                 105                 110
109 Phe Ser Lys Ser Cys Ser Leu Pro Gln Thr Ser Gly Leu Gln Lys Pro
110             115                 120                 125
111 Glu Ser Leu Asp Gly Val Leu Glu Ala Ser Leu Tyr Ser Thr Glu Val
112      130                 135                 140
113 Val Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Ile Leu Gln Gln
114 145                 150                 155                 160
115 Leu Asp Val Ser Pro Glu Cys
116                 165
119 <210> SEQ ID NO: 3
120 <211> LENGTH: 700
121 <212> TYPE: DNA
122 <213> ORGANISM: Homo sapiens
124.<220> FEATURE:
125 <221> NAME/KEY: misc_feature
126 <222> LOCATION: 1, 2, 3, 5, 6, 29, 30, 31, 581
127 <223> OTHER INFORMATION: n = A,T,C or G
129 <221> NAME/KEY: misc_feature
130 <222> LOCATION: (0)...(0)
```

W--> 132 `<400> 3`
W--> 133 `nnngnngttg caaggcccaa gaagcccann ntcctgggaa ggaaaatgca ttggggaacc 60`

```
134 ctgtgcggat tcttgtggct ttggccctat cttttctatg tccaagctgt gcccatccaa 120
135 aaagtccaag atgacaccaa aaccctcatc aagacaattg tcaccaggat caatgacatt 180
136 tcacacacgc agtcagtctc ctccaaacag aaagtcaccg gtttggactt cattcctggg 240
137 ctccacccca tcctgacctt atccaagatg gaccagacac tggcagtcta ccaacagatc 300
138 ctcaccagta tgccttccag aaacgtgatc caaatatcca acgacctgga gaacctccgg 360
139 gatcttcttc acgtgctggc cttctctaag agctgccact tgccctgggc cagtggcctg 420
140 gagaccttgg acagcctggg gggtgtcctg gaagcttcag gctactccac agaggtggtg 480
141 gccctgagca ggctgcaggg gtctctgcag gacatgctgt ggcagctgga cctcagccct 540
142 gggtgctgag gccttgaagg tcactcttcc tgcaaggact nacgttaagg gaaggaactc 600
143 tggtttccag gtatctccag gattgaagag cattgcatgg acacccctta tccaggactc 660
144 tgtcaatttc cctgactcct ctaagccact cttccaaagg                        700
```

```
146 <210> SEQ ID NO: 4
147 <211> LENGTH: 167
148 <212> TYPE: PRT
149 <213> ORGANISM: Homo sapiens
151 <400> SEQUENCE: 4
152 Met His Trp Gly Thr Leu Cys Gly Phe Leu Trp Leu Trp Pro Tyr Leu
153 1               5               10              15
154 Phe Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
155             20              25              30
156 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
157         35              40              45
158 Gln Ser Val Ser Ser Lys Gln Lys Val Thr Gly Leu Asp Phe Ile Pro
159     50              55              60
160 Gly Leu His Pro Ile Leu Thr Leu Ser Lys Met Asp Gln Thr Leu Ala
161 65              70              75              80
162 Val Tyr Gln Gln Ile Leu Thr Ser Met Pro Ser Arg Asn Val Ile Gln
163             85              90              95
```

RAW SEQUENCE LISTING   DATE: 01/28/2004
PATENT APPLICATION: **US/09/686,647A**   TIME: 13:53:04

Input Set : **A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT**
Output Set: **N:\CRF4\01282004\I686647A.raw**

```
164 Ile Ser Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Val Leu Ala
165          100              105          110
166 Phe Ser Lys Ser Cys His Leu Pro Trp Ala Ser Gly Leu Glu Thr Leu
167      115              120          125
168 Asp Ser Leu Gly Gly Val Leu Glu Ala Ser Gly Tyr Ser Thr Glu Val
169      130              135          140
170 Val Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Met Leu Trp Gln
171 145              150          155              160
172 Leu Asp Leu Ser Pro Gly Cys
173              165
176 <210> SEQ ID NO: 5
177 <211> LENGTH: 166
178 <212> TYPE: PRT
179 <213> ORGANISM: Murine
181 <400> SEQUENCE: 5
182 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu
183 1          5              10              15
184 Ser Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
185          20              25          30
186 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
187      35              40              45
188 Ser Val Ser Ala Lys Gln Arg Val Thr Gly Leu Asp Phe Ile Pro Gly
189      50              55              60
190 Leu His Pro Ile Leu Ser Leu Ser Lys Met Asp Gln Thr Leu Ala Val
191 65              70              75              80
192 Tyr Gln Gln Val Leu Thr Ser Leu Pro Ser Gln Asn Val Leu Gln Ile
193              85              90              95
194 Ala Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Leu Leu Ala Phe
195          100              105          110
196 Ser Lys Ser Cys Ser Leu Pro Gln Thr Ser Gly Leu Gln Lys Pro Glu
197      115              120          125
198 Ser Leu Asp Gly Val Leu Glu Ala Ser Leu Tyr Ser Thr Glu Val Val
199      130              135          140
200 Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Ile Leu Gln Gln Leu
201 145              150          155              160
202 Asp Val Ser Pro Glu Cys
203              165
206 <210> SEQ ID NO: 6
207 <211> LENGTH: 166
208 <212> TYPE: PRT
209 <213> ORGANISM: Homo sapiens
211 <400> SEQUENCE: 6
212 Met His Trp Gly Thr Leu Cys Gly Phe Leu Trp Leu Trp Pro Tyr Leu
213 1          5              10              15
214 Phe Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
215          20              25          30
216 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
217      35              40              45
218 Ser Val Ser Ser Lys Gln Lys Val Thr Gly Leu Asp Phe Ile Pro Gly
```

```
219     50                      55                      60
220 Leu His Pro Ile Leu Thr Leu Ser Lys Met Asp Gln Thr Leu Ala Val
221 65                      70                      75                      80
222 Tyr Gln Gln Ile Leu Thr Ser Met Pro Ser Arg Asn Val Ile Gln Ile
223                         85                      90                      95
224 Ser Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Val Leu Ala Phe
225                         100                     105                     110
226 Ser Lys Ser Cys His Leu Pro Trp Ala Ser Gly Leu Glu Thr Leu Asp
227             115                     120                     125
228 Ser Leu Gly Gly Val Leu Glu Ala Ser Gly Tyr Ser Thr Glu Val Val
229         130                     135                     140
230 Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Met Leu Trp Gln Leu
231 145                     150                     155                     160
232 Asp Leu Ser Pro Gly Cys
233                         165
236 <210> SEQ ID NO: 7
237 <211> LENGTH: 176
238 <212> TYPE: DNA
239 <213> ORGANISM: Mus musculus
241 <220> FEATURE:
242 <221> NAME/KEY: misc_feature
243 <222> LOCATION: 61, 66, 89, 151, 164
244 <223> OTHER INFORMATION: n = A,T,C or G
246 <400> SEQUENCE: 7
247 gtgcaagaag aagaagatcc cagggcagga aaatgtgctg gagacccctg tgtcgggtcc 60
```
W-->
```
248 ngtggntttg gtcctatctg tcttatgtnc aagcagtgcc tatccagaaa gtccaggatg 120
249 acaccaaaag cctcatcaag accattgtca ncaggatcac tganatttca cacacg      176
251 <210> SEQ ID NO: 8
252 <211> LENGTH: 18
253 <212> TYPE: DNA
254 <213> ORGANISM: Artificial Sequence
256 <220> FEATURE:
257 <223> OTHER INFORMATION: PCR 5' primer for exon 2G7
259 <400> SEQUENCE: 8
260 ccagggcagg aaaatgtg                                                 18
262 <210> SEQ ID NO: 9
263 <211> LENGTH: 22
264 <212> TYPE: DNA
265 <213> ORGANISM: Artificial Sequence
267 <220> FEATURE:
268 <223> OTHER INFORMATION: PCR 3' primer for exon 2G7
270 <400> SEQUENCE: 9
271 catcctggac tttctggata gg                                           22
273 <210> SEQ ID NO: 10
274 <211> LENGTH: 23
275 <212> TYPE: PRT
276 <213> ORGANISM: Murine
278 <400> SEQUENCE: 10
279 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu
```

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 01/28/2004
PATENT APPLICATION: **US/09/686,647A**   TIME: 13:53:05

Input Set : **A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT**
Output Set: **N:\CRF4\01282004\I686647A.raw**

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:3; N Pos. 1,2,3,5,6,29,30,31,581
Seq#:7; N Pos. 61,66,89,151,164
Seq#:22; N Pos. 361,385,397
Seq#:24; N Pos. 145,285

VERIFICATION SUMMARY   DATE: 01/28/2004
PATENT APPLICATION: **US/09/686,647A**   TIME: 13:53:05

Input Set : **A:\600-1-087CIPDIVCON – SEQUENCE LISTING.TXT**
Output Set: **N:\CRF4\01282004\I686647A.raw**

```
L:132 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3
L:133 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:0
M:341 Repeated in SeqNo=3
L:248 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:60
M:341 Repeated in SeqNo=7
L:293 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:297 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:301 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:304 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:308 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:312 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:461 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:465 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:470 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:475 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:494 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22 after pos.:321
M:341 Repeated in SeqNo=22
L:524 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:528 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:533 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:538 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:541 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:24 after pos.:120
M:341 Repeated in SeqNo=24
```